



Neural Interfaces Workshop

November 15-17, 2004

Hyatt Regency Bethesda Hotel
Bethesda, Maryland

Agenda

Monday, November 15, 2004

- 7:15 - 8:15 a.m.** **Registration**
- 8:15 - 8:20 a.m.** **Orientation and Introduction**
Dr. Joseph Pancrazio, National Institute of Neurological Disorders and Stroke (NINDS)
- 8:20 - 8:30 a.m.** **Welcome**
Dr. Story Landis, Director, NINDS
- 8:30 - 8:40 a.m.** **The Neural Interface Community**
Dr. William Heetdeerks, National Institute of Biomedical Imaging and Bioengineering (NIBIB)
- 8:40 - 9:40 a.m.** **Keynote Speaker**
Dr. Michael Merzenich, University of California, San Francisco
Brain Plasticity Contributions to Prosthesis-Assisted Rehabilitation
- 9:40 - 10:00 a.m.** **Break**
- 10:00 - 11:50 a.m.** **Plenary Session 1: Optimal Methods for Processing Information From Neural Signals**
Speakers: Dr. Grace Peng, NIBIB
Dr. Vasilis Marmarelis, University of Southern California
Analysis of Multi-Dimensional Neurophysiological Data
Dr. Chris Sackellares, University of Florida
Optimal Methods for Processing Information from Neural Signals
Dr. Dawn Taylor, Case Western Reserve University
Decoding Intent From a Plastic Neural System
- 11:35 - 11:50 a.m.** **Discussion**
Facilitator: Dr. Steven J. Schiff, George Mason University
- 11:50 - 12:00 p.m.** **Student Assistance Program**
Dr. Meredith Temple-O'Connor, NIBIB
- 12:00 - 1:00 p.m.** **Lunch**
- 1:00 - 5:00 p.m.** **Concurrent Breakout Sessions**
- 1:00 - 5:00 p.m.** **Breakout A: Cortical Prosthesis/Functional Neural Stimulation**
Moderators: Dr. Daofen Chen, NINDS
Dr. Naomi Kleitman, NINDS
- 1:00 - 1:40 p.m.** *Speakers: Dr. Kensall Wise, University of Michigan*
Micromachined Stimulating Microelectrode Arrays



Agenda

Monday, November 15, 2004, continued

- 1:40 - 2:20 p.m. *Speakers:* *Dr. David Edell, InnerSea*
Insulating Biomaterials for the CNS
- 2:20 - 3:00 p.m. *Dr. Robert Kirsch, Case Western Reserve University*
Restoration of Hand and Arm Function through Neuromuscular Stimulation
- 3:00 - 3:10 p.m. ***Break***
- 3:10 - 3:50 p.m. *Dr. Douglas McCreery, Huntington Medical Research Institute*
Functional Microstimulation of the Lumbosacral Spinal Cord
- 3:50 - 4:30 p.m. *Dr. Arthur Prochazka, University of Alberta*
Functional Microstimulation of the Spinal Cord for Bladder Control
- 4:30 - 5:00 p.m. **Discussion**
Breakout B: Auditory Prosthesis
Moderator: Dr. Roger L. Miller, National Institute on Deafness and Other Communication Disorders (NIDCD)
- 1:00 - 1:40 p.m. *Speakers: Dr. Douglas McCreery, Huntington Medical Research Institute*
A Cochlear Nucleus Auditory Prosthesis Based on Microstimulation
- 1:40 - 2:20 p.m. *Dr. Paul Abbas, Arizona State University*
Effects of Remaining Hair Cells on Cochlear Implant Function
- 2:20 - 3:00 p.m. *Dr. Russell Snyder, University of California at San Francisco*
The Neurophysiological Effects of Simulated Auditory Prosthesis
- 3:00 - 3:10 p.m. ***Break***
- 3:10 - 3:50 p.m. *Dr. Patricia Leake, University of California at San Francisco*
Protective and Plastic Effects of Patterned Electrical Stimulation of the Deafened Auditory System
- 3:50 - 4:30 p.m. *Dr. Robert Shepherd, Bionic Ear Institute*
Protective Effects of Patterned Stimulation in the Deafened Auditory System
- 4:30 - 5:00 p.m. **Discussion**
- 5:30 - 7:30 p.m. **Poster Session - (Chesapeake Suites)**
- 7:30 p.m. **Informal Gathering at McCormick & Schmick's Restaurant**



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- 7:00 - 8:00 a.m. **Registration**
- 8:00 - 9:30 a.m. **Plenary Session 2A: Auditory Prosthesis as a Paradigm for Successful Neural Interfaces**
Moderator: Dr. Roger L. Miller, NIDCD
- 8:00 - 8:30 a.m. *Speakers: Dr. Donald Eddington, Massachusetts Institute of Technology*
Speech Processors for Auditory Prosthesis I
What Can Single Fiber Models Teach Us?
- 8:30 - 9:00 a.m. *Dr. Blake Wilson, Research Triangle Institute*
Speech Processors for Auditory Prosthesis II
- 9:00 - 9:30 a.m. **Discussion**
- 9:30 - 10:15 a.m. **Break**
- 10:15 -12:00 p.m. **Plenary Session 2B: Optimizing System Design for Neural Interfaces**
Speakers: Dr. John Donoghue, Brown University
Optimizing System Design for Neural Interfaces
- 10:15 - 10:35 a.m. *Dr. Daryl Kipke, University of Michigan*
Microscale Implantable Neural Interfaces for Cortical Neuroprosthesis
- 10:35 - 11:05 a.m. *Dr. Donald Woodward, Wake Forest University*
Optimizing System Development and Microwire Arrays for Recording and Stimulation
- 11:05 - 11:40 a.m. **Roundtable Discussion**
- 11:40 - 12:00 p.m. **Lunch**
- 12:00 - 1:00 p.m. **Plenary Session 2C: Optimizing Tissue Interactions With Neural Interfaces**
Moderator: Dr. Joseph Pancrazio, NINDS
- 1:00 - 2:55 p.m. *Speakers: Dr. David Martin, University of Michigan*
Polymer Coatings for Neural Prosthetic Devices
Dr. Patrick Tresco, University of Utah
Brain Tissue Response to Implanted Silicon Microelectrode Arrays
- 1:05 - 1:45 p.m. *Dr. Ravi Bellamkonda, Georgia Tech*
Neural Interfaces: Micromotion Induced Scarring and Its Modulation
- 1:45 - 2:10 p.m. **Neural Interfaces: Micromotion Induced Scarring and Its Modulation**



Agenda

Tuesday, November 16, 2004, continued

- 2:10 - 2:25 p.m.** **Discussion**
Facilitator: Dr. Jerrold L. Vitek, The Cleveland Clinic Foundation
- 2:25 - 2:45 p.m.** **Break**
- 2:45 - 4:30 p.m.** **Plenary Session 2D: Deep Brain Stimulation: Theoretical and Clinical Aspects**
Moderator: Dr. Paul Sheehy, NINDS
- 2:50 - 3:20 p.m.** *Speakers: Dr. Elena Moro, University of Toronto*
DBS for Movement Disorders: Criteria of Selection
- 3:20 - 3:50 p.m.** *Dr. Marjorie Anderson, University of Washington*
Mechanisms for DBS Effectiveness in Parkinson's Disease
- 3:50 - 4:30 p.m.** *Dr. Warren Grill, Duke University*
- 4:30 - 5:00 p.m.** **Discussion**
- 5:30 - 7:30 p.m.** **Poster Session - (Chesapeake Suites)**
- 6:30 p.m.** **DBS Consortium Dinner - (By Invitation Only)**
Keynote Speaker: Dr. Rudolfo Llinas
Nanowire Transvascular Neuronal Recording in the CNS
- Speakers: Robin Elliott, Executive Director, Parkinson's Disease Foundation*
- Sharon Metz, National Parkinson Foundation*
NPF Centers of Excellent - DBS Survey Results
- Dr. Oleg V. Kopyov, California Neuroscience Institute*
Magnetic Resonance Spectroscopy (MRS) in Parkinson's Disease
- Carol J. Walton, Executive Director, The Parkinson Alliance*
DBS-STN - Patient Surveys
- Sponsors: The Parkinson Alliance*
California Neuroscience Institute
National Parkinson Foundation
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- 7:00 - 8:00 a.m. **Registration**
- 8:00 - 9:45 a.m. **Plenary Session 3A: Practical Issues in Neural Interfaces**
Moderator: Dr. Michael Weinrich, National Institute of Child Health and Human Development (NICHD)
- 8:05 - 8:35 a.m. *Speakers: Dr. Joseph Schulman, Alfred Mann Foundation*
Wireless FES Network Inside the Human Body
- 8:35 - 9:05 a.m. *Dr. William J. Marks, Jr., University of California San Francisco*
- 9:05 - 9:35 a.m. *Dr. Andrew Schwartz, University of Pittsburgh*
Cortical Control of Neural Prosthesis
- 9:35 - 10:05 a.m. *Dr. Jon Joseph, Cyberkinetics, Inc.*
Neural Interface Roadmap
- 10:05 - 10:15 a.m. **Discussion**
- 10:15 - 10:30 a.m. **Break**
- 10:30 -12:00 p.m. **Plenary Session 3B: Research and Development Needs for Neural Interfaces**
Moderator: Dr. Joseph Pancrazio, NINDS
- 10:30 - 11:00 a.m. *Speakers: Dr. Ali Rezai, The Cleveland Clinic*
- 11:00 - 11:30 a.m. *Dr. Hunter Peckham, Case Western Reserve University*
- 11:30 a.m. - 12 p.m. **Roundtable Discussion**
Facilitators: Dr. Grace Peng, NIBIB
Dr. Paul Sheehy, NINDS
Dr. Michael Weinrich, NICHD
Dr. Roger L. Miller, NIDCD
- 12:00 p.m. **Workshop Adjourns**

